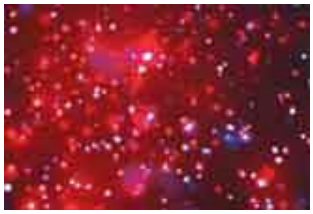

Age of Universe Revised, Again

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We speculated just last week in our Top 10 Space Mysteries [See #8] that the ongoing effort to figure out how hold the universe is would yield at least one more estimate during 2003.

We had no idea it would come so soon.

In a study published today in the journal ***Science***, a team of researchers says the universe is between 11.2 billion and 20 billion years old.

Most estimates in recent years have ranged between 10 billion and 15 billion years. Last year, data supplied by the Hubble Space Telescope led to an apparently refined estimate of 13 billion to 14 billion years.

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The new calculations, by Lawrence Krauss of Case Western Reserve University and Brian Chaboyer at Dartmouth College, involved new information about old star clusters in our galaxy and a better understanding of how stars evolve. It was based on when stars are thought to end the main sequence of their lives, a point at which they've used up the hydrogen that fuels thermonuclear fusion and therefore begin to dim.

The new appraisal comes with a 95 percent level of confidence, which means the door is still open for further revision and that last year's tighter Hubble estimate might prove on track.

The new estimates were made as part of a larger effort to understand how the universe is structured, and they agree with an increasingly solid case suggesting that 95 percent of the universe is controlled by so-called dark energy. Scientists don't know what this mysterious force is, or how it works, but they see evidence of it in the fact that the universe is expanding at an ever-increasing rate.

Dark energy is sometimes described as applying a negative pressure to the universe. While gravity holds individual galaxies together, dark energy works to pull galaxies from each other at faster and faster rates.

Cosmologists, who speculate about the origin and operation of the universe as a whole, know they have their work cut out for them even as their understanding grows.

"We are living in a golden age of observational cosmology, where our fundamental picture of the universe has been revolutionized in the last decade," Krauss said. "At the same time, we are establishing the essential features of the cosmos that will serve as the datum at the basis for fundamental physics in the 21st century and beyond."